PARAMANIA
POWERGLIDERS

ALL IN ONE WING

SPEED STABILITY

ACTION GT

NEXT GENERATION REFLEX POWERGLIDER

User Manual

Paramania Action GT Powerglider Owner's Manual V1

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7 Summary

1.1 Introduction

Paramania feels privileged that through its products, the Reflex MK1 & 2, the Action and Revolution, to have progressively improved levels of safety, speed and performance for our sport, paramotoring.

Our designer, Mike Campbell-Jones has worked to develop Reflex technology in soft wings, since designing the original Reflex wing in 1994. His experience has given him and the Paramania team the ability and insight to design wings that consistently bring new technology to the foreground.
The Action GT is no exception. It is the first of a new species of bird, a hybrid, a powerglider which can change into a paraglider. It is two completely different types of wing, in one.

We love it and know you will enjoy it, congratulations for choosing the very latest in reflex technology. - The Action GT.

Note: The Action GT is a high-end quality product – As such it has been fully inspected, firstly by the factory and secondly by your local Paramania dealer.
Should you not be entirely satisfied with your Paramania Powerglider.
Please contact your dealer directly. (And if you're happy contact them anyway).

1.2 Pilot skill level – recommendations

As pilots we feel that you are likely to continue growing into this wing for several years.
The Action GT can adapt to suit a full range of conditions and types of flying its pilots wish.

Basically, to fully understanding and appreciate exactly what this wing is capable of. You the pilot in control may also need to adapt.

For this reason - Paramania recommends that to fly the Action GT, a minimum level of pilot experience of at least 50hrs and one full year's season of flying is desirable.

& The purpose of this manual is to help you understand, so please read carefully!

1.3 ABOUT YOUR ACTION GT POWERGLIDER (some FAQs)

What makes the Action GT so different?
Within our sport there are limits. For instance there is a limit of how fast you can fly and still be able to foot launch. Over the last few years Paramania and its team have been exploring new possibilities of extending this flight envelop in both directions. Paramania are now proud to introduce the Action GT with a “flapped” reflex wing section.

Our latest Reflex aerofoil section is shape controlled by a combination of our innovative line gathering and semi ridged trim systems.
When the wing is flown above the neutral trim bar position it has all the characteristics of our previous Reflex designs only much more efficient. The pilot flies inactively, generally fast with hands off toggles most of the time. (see diagram GTD 1,2,& 3)
When trimmed below the neutral position the GT moves much closer to a paraglider with similar performance of sink rate and glide ratio as other top models, it becomes the equivalent of a performance/intermediate paraglider and depending on the conditions, should be flown more actively with the pilots hands more on the control toggles.

Why the extra large center section (fuselage)?

There are 3 principal reasons why the Action GT has a big centre cell

1) Structurally - When paragliders are constructed with increased aspect ratio, they usually become less ridged; this is because the centre chord of the wing is narrower. By increasing the depth in the middle of the wing, it becomes much stiffer, allowing us to produce a wing with a higher aspect ratio whilst keeping the same levels of stiffness as wing with less aspect ratio.

2) Aerodynamically - The large centre cell acts as a “wing strake”, this helps to control the span wise airflow. Birds and aircraft alike all have a fuselage, this helps to align the airflow at the centre of the wing, which reduces induced drag and gives better directional stability. In the case of a standard paraglider there is nothing to align the airflow and because a paraglider has a lot of an-hydral (negative front profile) span-wise flow is exaggerated compared to flatter profiles. This fuselage finishes as a point this is good for vortex separation.

3) **The large center rib** also provides a method of linking the lines from both sides (pilot hang points). This link gives the wing faster inflating characteristics, because the weight of the pilot is transferred to both sides at once, much like cross bracing on a harness, but as an integral part of the wing (See centre keel lines in diagram GTLD2) .

Why the unusual line configuration?

* The Action GT has an interactive line configuration. Both sides of the wing are linked through the center cell, the wing remains responsive to weight shift because of “center keel lines”™, that allow controlled weight shift movement from side to side. So the pilot is able to transfer weight without distorting the center of the wing.
* The linking of both sides dramatically improves tuck recovery because the pilot’s weight is always loading more than just half of the wing.
* The GT has a lot of extra lines towards the tips, these act as a safety net, reducing the possibility of cravats, caused by fabric passing between lines.
* The angles of certain lines are individually calculated to act as a gathering system for the complex changes of our latest Reflex aerofoil shape.

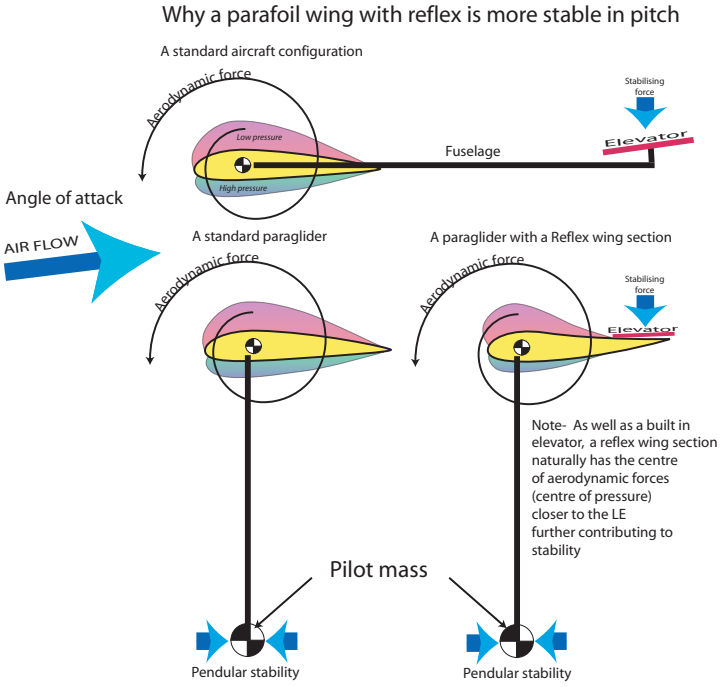
How does the Action GT and Revolution maintain such a clean top surface?

It is a fact that most manufacturers have programs that calculate the diagonal ribs by shrinking the cell between the diagonals. This means odd widths and therefore different cells thicknesses across the span.
Paramania wings use a new calculation method, all the cell widths are in proportion and it is the diagonals that are individually calculated at each point throughout the wing.
The combination of this new design method, the inclined oval holes for the cross-port venting and Gin’s precise manufacturing, insure that all Paramania’s wings maintain super smooth top surfaces.
The result is better load distribution, improved performance and faster inflation characteristics.

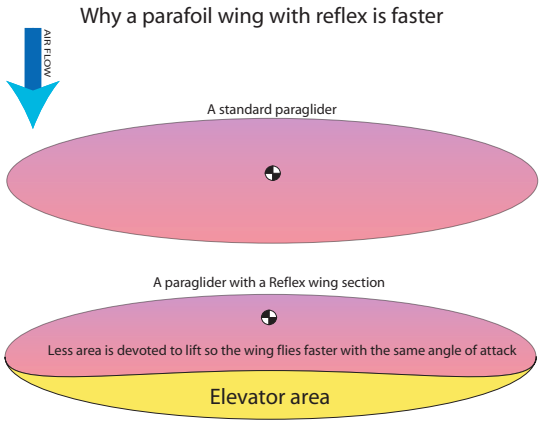
What is a reflex profile?

“A Reflex wing section” Is a wing section is that has an elevator built into its shaping, so is auto-stable and pitch positive. See diagrams

RP1UK copywrite Mike Campbell-Jones 22-6-06 -


Why a parafoil wing with reflex is more stable in pitch
A standard aircraft configuration
Aerodynamic force
Low pressure
High pressure
Stabilising force
Elevator
Fuselage
Angle of attack
AIR FLOW
A standard paraglider
A paraglider with a Reflex wing section
Aerodynamic force
Aerodynamic force
Stabilising force
Elevator
Note- As well as a built in elevator, a reflex wing section naturally has the centre of aerodynamic forces (centre of pressure) closer to the LE further contributing to stability
Pilot mass
Pendular stability
Pendular stability

RP2-UK copywrite Mike Campbell-Jones 22-6-06 -


Why a parafoil wing with reflex is faster
AIR FLOW
A standard paraglider
A paraglider with a Reflex wing section
Less area is devoted to lift so the wing flies faster with the same angle of attack
Elevator area

Whilst sink rate is reduced (not a problem with power), the glide and efficiency at speed is improved because the area flown on, has an effective higher aspect ratio, which gives a flatter polar curve
Eg Reflex wing sections = more stability and efficiency at higher speeds

Note:- Some of the latest developments in reflex technology are in the control of the elevator area using intricate systems that improve slow speed flight characteristics, so giving the best of both worlds with a wider range of speed and performance

1.2 About this manual

The purpose of this manual is to offer guidelines to the pilot in the use of the Paramania Action GT powerglider and is in no way intended to be used as a training manual for this or any other paramotor wing or paraglider. You may only fly an aircraft of any description when qualified to do so or when undergoing training from an accredited School or Instructor.

It must be understood that flying can be a dangerous activity unless undertaken by properly trained people flying in a responsible and disciplined manner. As the owner of a Paramania Action GT Powerglider, you have chosen to fly one of the safest aircraft of its type available.

Nevertheless, in the final analysis, any aircraft is only as safe as the pilot flying it and it is incumbent upon you to make sure that you have the required training and experience to make your own judgements about how, where and when you fly. Paramania, its Directors, Employees and Agents can accept no liability for any consequences arising from the use of their products howsoever caused.

Particular attention must be paid to the danger of injury to the pilot and bystanders from a rapidly rotating propeller, which can break and inflict injury at some distance and the dangers inherent with flammable fuel and other combustible or fusible materials.

Paragliding is a relatively new activity that is still evolving and powered paragliding (paramotoring) is one aspect of this form of sport aviation. Should you have any doubts about the suitability of the wing for the type of flying you wish to practise or should you wish to extend your flying in other ways. We recommend that you seek further guidance from your own instructors or direct from Paramania. Under no circumstances should you attempt to copy the type of flying that may have been demonstrated to you or that appears on any video demonstration of the wing without first receiving proper aerobatics training from Instructors experienced in the use of this wing.

It is essential in order to achieve satisfactory performance that proper consideration be given to the matching of this powerglider with a suitable harness, motor and propeller. While we can make recommendations, the choice and suitability of any particular harness or motor remains outside our control and responsibility.

This manual will soon be available in French, Spanish and German - please contact Paramania should you require a different version.

2 ABOUT YOUR ACTION GT POWERGLIDER

2.1 Design

The Action GT has been designed by Mike Campbell-Jones. His history in the development of powergliders that exclusively use Reflex wing sections, coupled with his experience in Microlight aircraft and glider design, means that your Action GT wing benefits from a wealth of knowledge that spans over 28 years, back to the early days of hang-gliding.

Microlights where initially developed as powered hang-gliders that later favoured more powerful engines and smaller more stable wings. It soon became clear that the faster your wing, the more often you could use it!
Naturally it follows, that the concept of a utility paramotor flying machine requires the same philosophy. So the pilot can spend less time and effort flying actively, in response to every lump and bump and more time navigating, whilst getting comfortably from A to B or performing other tasks, such as photography, observation or general flying.

Although your Action GT wing has been designed to fly like a conventional paraglider, the reflex wing section means that it has an elevator built into its shape. The wing no longer completely dependents on payload as its only source of stability, It maintains its own attitude in pitch, rising and falling through thermals and turbulence, whilst remaining stable above the pilot's head, requiring minimal control input.

The trimmer system allows you to raise the rear of the airfoil, effectively reducing the chord and surface area by some 30%, giving the wing a higher wing loading and increased speed without changing the angle of attack. The centre of pressure also moves forward adding further to the pitch stability. This redistribution of loading gives the wing exceptional tuck-resistance and increases the working aspect ratio the result is a faster, more efficient wing under power and at speed, much like a traditional powered aircraft.

When requiring more lift at lower speeds, the rear section can be trimmed down to restore a fully flapped Reflex airfoil, the Action GT changes its characteristics, becoming closer to a conventional paraglider with smooth sporty handling, short slow take offs and steep climb outs. So like having two wings in one.

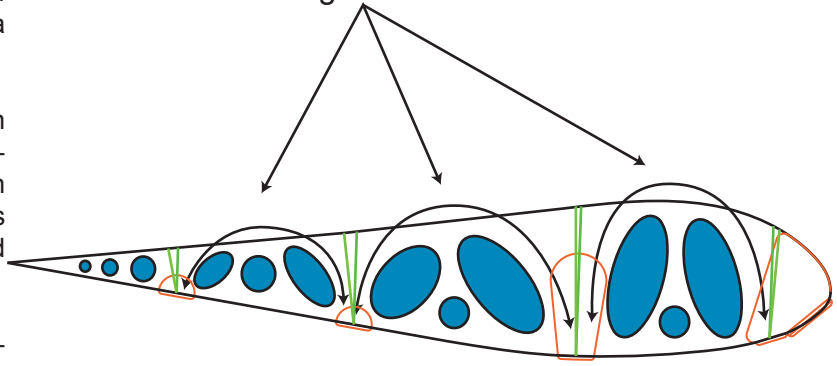
2.2 Construction

We now produce our wings with Gin gliders based in Korea, Gin's renowned quality is clearly visible in all of our wings and like all Gin's products our wings carry a lifetime guarantee.

Your Action GT's strength and durability has been achieved through careful choice of modern materials and innovative design. All materials from which it is constructed are batched and every stage in its manufacture can be traced to a named operator and checker.

The top and bottom surfaces are made from the hard-wearing Porsha-Marine NCV, 44 and 37gm respectively. The wing tips, leading and trailing edges are reinforced using a mix of load tape and Mylar. The semi-closed leading edge improves the air-dynamics, whilst stabilizing lateral movement between surfaces, giving it a more solid/rigid feel once in the air.

RRIB Showing Inclined oval hole load distributions



& standard Paramania rib reinforcements

The structural ribs have been designed with inclined oval ports that allow air to flow to the areas within the wing where internal pressure is needed most. They open like valves to increase their area during inflations when the ribs are off-loaded, and minimize distortions normally created by conventional holes and distribute the loads efficiently from the line attachment points into the top surface.

Suspension line attachments are reinforced in 3 dimensions, vertically with the main rib, then at an angle with diagonal ribs and 90 degrees with bottom surface lateral tape. The ribs are heavily reinforced with Mylar wherever the loads are substantial, i.e. around the "A" and "B' line attachments.

The line configuration and diagonal rib structure are sharing the same angles throughout the wing, enhancing the load distribution, whilst ensuring that the lines are evenly loaded. This we have found gives much quicker more efficient inflations.

The Action GT has been built with paramotoring in mind and when new, has a safety factor of some 50% over and above its tested loading.
It has been engineered to perform to its specifications for about 400 hours.

All lines are made of Gin Arimid Technora, the latest in line technology and incorporates the best qualities of its predecessors, Kevlar and Dynema, It is both strong and flexible whilst remaining temperature stable, and less prone to shrinkages when lightly loaded.

The lines are split into 4 categories,
Quadries, Thirtaries, secondary and primaries. Line diameters are 0.6, 1.1, 1.3, 1.6 & 2,3 mm respectively. The larger diameters being the primary lines,
The malions to which the lines are attached to the risers, are made of polished stainless steel, which avoids corrosion and gives excellent strength and durability. The riser material is 1.2K / 25mm polyester webbing. The main attachment points are reinforced with Cordura, to protect against wear from the karabinas.

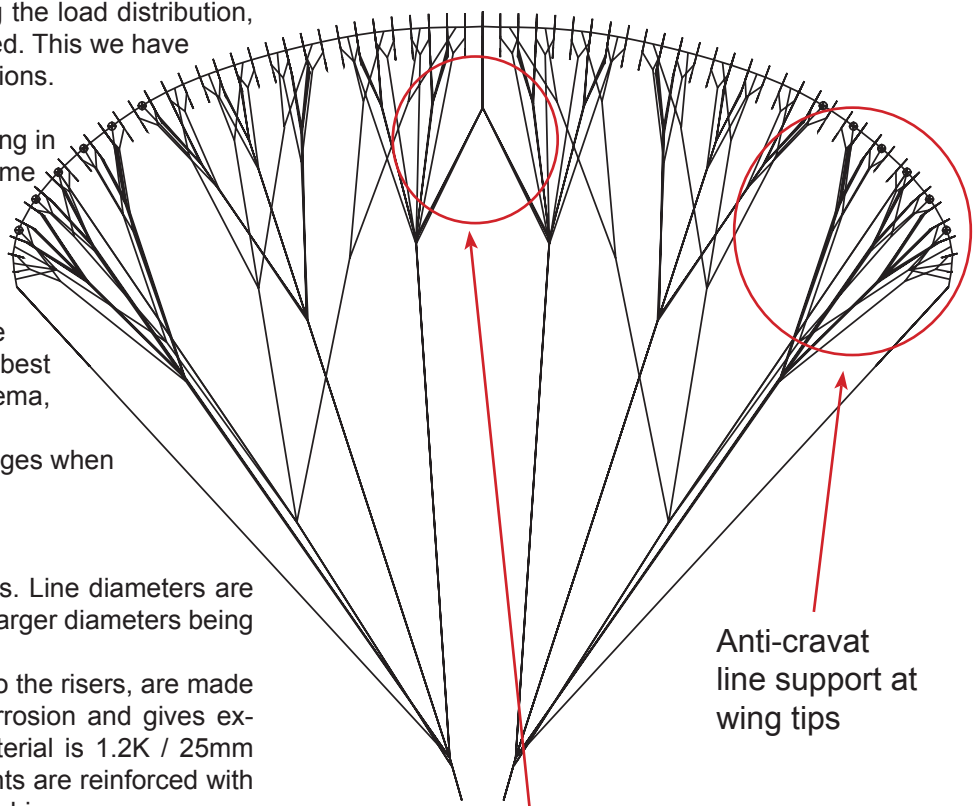


Diagram GT LD2

2.3 What your new Action GT wing comes with
The Glider, User manual
Paramania Ruck-sack (reversible, normal or field)
Stuff sack & compression strap
Speed barBasic repair kit, Paramania T-Shirt,
Helmet stickers & mini wind socks x2

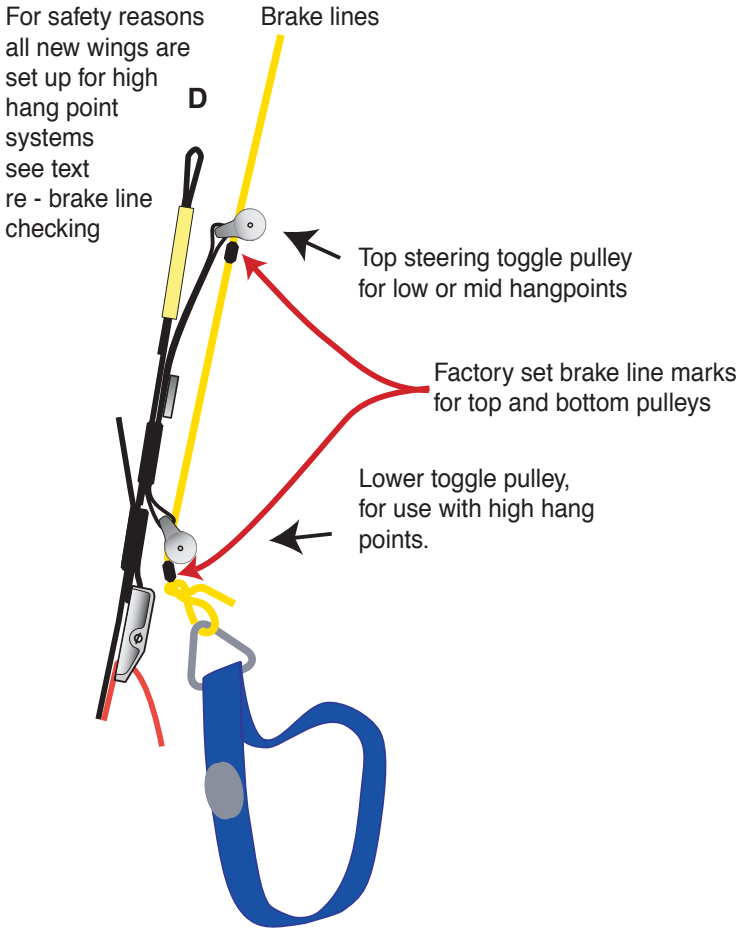
2.4 Setting up the controls

Hang check- The following is best carried out by an instructor or at the very least an experienced motor pilot. Before flying your Action GT with a motor unit, we recommend that you do a static hang test.
This is done by hanging your motor unit from an appropriate structure from the wing attachment points by using a strong rope or strap, then by sitting in the harness, get an assistant to measure up the risers from the hang points up. The aim is to make sure that you, the pilot, are able to reach the brakes whilst in flight. Allowances should also be made for the wind blowing the toggles out of reach.
The Revolutoin's risers are shorter than most conventional paragliders, which reduces the potential problem.

Brake line lengths- The Action GT brake lines are clearly factory marked in two places. The risers have a secondary lower pulley system, to allow for high hang point power units These brake positions should need no adjustments see diagram GTR1 for details
Higher hang points require longer brake lines, lower hang point's shorter ones.

Note: we recommend that brakes are not set too short othwise full Reflex effect may be lost. (see DTD 3)

GT BL01 Diagram showing factory brake setting & adjustments


For safety reasons all new wings are set up for high hang point systems see text re - brake line checking
Brake lines
D
Top steering toggle pulley for low or mid hangpoints
Factory set brake line marks for top and bottom pulleys
Lower toggle pulley, for use with high hang points.

Double-checking brake line lengths (a useful tip)
Again it is better to seek the advice and assistance of a local instructor or experienced pilot. Choose a day when there is a steady breeze of about 10Kph. Then with an ordinary harness or your motor unit on your back, visually check lengths,(2.4 Continued) by ground-handling the wing above your head. When the wing is nicely level, check that when the brakes are up against the brake pulleys that the trailing edge of the wing is not being pulled down. Then as you gently pull the brake you should have only a few centimetres of movement before the brakes start to pull down on the trailing edge of the wing. Make sure it is the same length on both sides.
Note: - it is safer to have this adjustment too long than too short.
Note : - When free flying the wing should be set up though the top pulley and with the shorter lines

All new gliders leave the factory rigged for high hang points.

3 FLIGHT OPERATIONS

3.1 Flying With and Without a Motor

Although the design philosophy of the Action GT is that of a high-speed paramotor wing, which performs well as a free flying glider and may be flown as such with no adjustment. Slower trim settings, reduce internal air pressure and consequently give a lighter feel to the brakes and a better sink rate.
The main difference in the Action GT compared with other paragliders is the increased resistance to tucking, both on launch and in flight; its greater speed range and stability means that generally, it can be flown in stronger conditions safely. Basically the glider becomes more stable the faster you fly.

First Flights
We recommend that, to give yourself the chance to get used to it, your first flights should be made on the just below the neutral range of trim settings, where, the Action GT will feel more familiar, like a conventional wing. With this trim try flying with a small amount of brake - at the point where they just begin to feel heavier. In practice, this point will be encountered at about the one-quarter-brake position.
When you have become fully confident in your wing, try experimenting with slower and faster trim-settings, weight-shift and speed bar and enjoy the extra speed and security the Action GT gives you (See GTR 02 for details).
Note : - To ensure that the trim system grips efficiently, simply lift the webbing adjustment loop in the opposite direction after each adjustment, (this helps the webbing material over the teeth of the cam buckle).

Forward launch
We recommend that when the wing is laid out, that all the lines are at full length with little or no slack between wing and pilot. Then pull the brake lines in, to ensure that the middle inflates first. The Action GT is easily inflated by using “A” riser’s only. When launching simply move forward from this position pulling on the “A” risers, whilst keeping the pressure balanced between each side (meaning the tension on the “A” risers). The glider shows little or no tendency to dive overhead, so frontal collapses which so often lead to failed launches, are rare. Instead the glider almost waits for you to catch up with it.

Note:- Too forceful a pull on the “A’s” may crumple the leading edge and hinder the launch. Indeed in certain trim positions the Action GT requires no pull at all, just accelerating forward movement only. See GTR 02 for ideal Take off trim position details

Reverse launch
Yet again, the glider is very easy to launch because it does not over-shoot, so the pilot has little or no need to hold the wing back before making the turn. Reverse launches on this wing can be carried out in as little as 5 Kph.

In Flight
In flight the greater speed range of the Action GT may require some management. But once you have mastered how to use the speed to your advantage it becomes pure fun. Its tight handling allows you to make the best use of thermal cores, and its glide at speed means less time is spent in sinking air masses before reaching the next thermal. Limits have been provided to the range of the trim settings to avoid the danger of stalling when flying with the trim pulled right down and with maximum brake. With the trim fully released, the wing takes on more solid characteristics, carving through the air with even more pitch stability. The brake pressures increase and so does the range of movement prior to the stall point. Turns and rate of roll are linked in a linear fashion to the progressive feel of the brakes.

Use of the speed bar
The bar increases the speed by approximately 30%. Unlike most wings there is little or no loss of stability, in fact the wing seems to cut through turbulence even better than before application. However, if any instability is encountered due to excessive conditions it is recommended to release the bar for recovery and to return to normal flying mode. The brake pressures also increase when the bar is used, so it is more for use during straight and level flight. As you become more experienced, careful release of the bar whilst entering turns gives an effect, similar to pulling the stick back in a conventional aircraft. Although the speed bar can be used with confidence throughout the whole range of the trim settings, it is obviously most effective when used with the trims off - I.e. on the fast setting.
Note : - To ensure that the trim system grips efficiently, simply lift the webbing adjustment loop in the opposite direction after each adjustment, (this helps the webbing material over the teeth of the cam buckle).

Landing- The Action GT has a reasonable glide so good planning is required on approaches. The brakes, light at first, become progressively heavier over a healthy amount of travel, giving plenty of warning of a stall. With trims on slow the wing lands like any other paraglider, plenty of air speed on approach, progressive flare, converting speed into lift, till the moment of touchdown. When landing with the fast trim on, the process of bleeding off the extra speed to land can take longer and require more space. In this mode there is a lot of stored energy, so you may find yourself climbing out again if you aren't that smooth on the controls. However, the brakes are very powerful. The last bit of brake travel really shuts the wing down and slows you up.
It does not take long to develop the confidence to fly in stronger winds than normal, but great care must be taken when flying fast near the ground. The Action GT stores energy well, so whilst it is possible to bleed off your speed without losing height before touch down, respect must be shown for the higher speeds possible, especially in slope landings.
On landing in high winds the glider may be collapsed with confidence using a strong pull on the rear or B risers.

3.2 Flying Under Power

Note: Thorough/Complete pre-flight checks for glider, harness and engine are essential prior to any launch.

For powered flight many of the characteristics are the same as in the previous section (3.1), However there is a certain amount of additional information, particularly where the addition of the thrust of the power unit and correct matching of the wing to the motor unit is concerned. Paramania cannot be held responsible for the multitude of combinations that may get used, however if you wish to contact us we can offer some advice.

3.2.a Forward Launching the Action GT in Nil Wind

While there may appear to be no wind this is rarely the case and it is essential for aircraft of this type to take off and make the initial climb out to a safe height (depending on the surrounding terrain) into wind. This makes maximum use of the wind and avoids the danger of losing airspeed when climbing out steeply through wind gradient. Particular attention must be paid to trees, power lines and other large obstacles and any rotor that they may generate.

Preparing the wing - Lay the glider out, downwind of the motor, so that the lines are fully extended and as if attracted to the motor or central focal point, then lay the risers down ready to clip in.
Set the trimmers to the take off position, faster settings may be desirable in stronger conditions, (see diagram GTR02).
Make sure that when warming up the engine you do so upwind of the wing, and then stop it whilst clipping in.

After carrying out the following checks: -

Pilot prepared & clothing safe?
Helmet on and fastened?
Malions secure on risers?
Trims set?
Nothing is likely to foul the prop?
Speed bar system running freely and out of harm's way?
Steering toggles and brake lines free and not twisted?
Engine delivering full power?
Airspace is clear for take off?

Attach the glider; proceed with the launch (as in section 3.11 Launching).
From now on you should try to control the glider whilst facing forwards. If the wing is low behind you and you turn around the lines will trail over the propeller. However, falling backwards onto the motor is both dangerous and expensive and must be avoided at all costs, even that of a few damaged lines!
During the launch, If the pressure on each of your hands feels even, open the throttle to full take off power, leaning backwards against the thrust so that the engine is pushing you along the ground rather than into it.
It is best to try and leave the brakes alone and just let the canopy come up. If it starts to go off to one side, increase the pressure on the riser on the lower side, whilst moving sideways towards it and the centre of the wing. Where possible maintain the direction of your launch. If the wing starts to drop backwards, increase to pressure on both "A" risers to help it up, as you increase power, try to maintain a constant angle with the motor and smooth power control. Any sudden changes will alter your course because of the powerful gyroscopic and torque effects.
If the canopy is so far off to the side or behind that it cannot be recovered, kill the engine and abort the take-off and reassess the launch conditions. As the canopy comes up the drag reduces, it should stabilize over your head without overshooting you. This is a good time to check that your wing is nicely inflated and that there are no tangles or lines fouled, but this must be done whilst on the move and without turning. When you feel the resistance reduce, allow your run to accelerate. Feel for pressure on the brakes, coming down on them as required to steer or to increase lift for taking off.

Points to note:-
* If your propeller protection cage is flimsy enough, the pressure of the lines on it during launch may distort it to the point where it fouls the prop. If this is the case make sure the lines have cleared the cage before you open the throttle.
* All control inputs should be smooth and progressive.
* Don't attempt to take off if the canopy isn't roughly level overhead. Dangerous oscillations may result if you apply full power with it too far off to one side.
* Keep your undercarriage down until you are definitely flying
* The faster the trim setting, the more brake the glider will need to get off the ground.

3.2.b Reverse Launching in Stronger Winds

Because the Action GT launches so easily it is possible to perform a reverse launch with both front risers and one brake in one hand and the throttle and opposite brake in the other. If the wind is appreciable this is the easiest method of launching, but if the wind is light and variable, the difficulty of running backwards safely with a motor on makes a forward launch preferable.

It is wise not to open your Action GT out to the point where it is liable to be caught by the wind until you are ready to launch, especially if it is already connected to your motor.

Lay the folded glider on its back with the trailing edge pointing into the wind.
Unfold it sufficiently only to locate and untwist the risers and check that no lines have gone over the leading edge.

Extend the risers upwind as usual, separating left from right.

We suggest that you pre-twist the risers over each other half-a-turn in the direction in which you wish to turn during launch and lay them out in this position with the rear risers uppermost. This is because, once clipped in, the propeller cage on your back makes it virtually impossible to turn without assistance when the wing is on the ground.

Carry out your standard pre-flight checks now.

Having started and warmed up your motor upwind of the canopy, attach yourself to the power unit, face the canopy, approach the risers and clip them on to the appropriate malions.
Build a wall first using front and rear risers simultaneously. We recommend that you momentarily raise the glider off the ground to check for tangles and line snags.
Holding risers, brakes and throttle control as outlined above, pull the front risers up to lift the glider over your head. It is unlikely to over-fly you, especially if it is trimmed to fly fast. This may be contrary to what your paragliding intuition tells you, but on the faster settings (trim neutral or above) the Action GT's reflex wing section stabilizes the wing and prevents it from pitching forward. It may even sit back a little but applying a small amount of brake makes it pop forward.
When the glider is steady above you turn round, apply power and take off.
As with forward launching, the trim/power/brake relationship must be established for the best rate of climb and forward speed.

Points to Note:-

* This is a cross-hands reverse launch. You must master this technique before attempting it under power. Your local Paragliding School will assist you here.
* All control inputs should be smooth and progressive.
* Don't attempt to take off if the canopy isn't roughly level overhead. Dangerous oscillations may result if you apply full power with it off to one side.
* Keep your undercarriage down until you are definitely flying!
* The faster the trim setting, the more brake the glider will need to get off the ground.

Speed systems may cause problems when clipping in. Don't get your lines crossed!

3.2.c The Climb Out

Once off the ground and flying safely, continue into wind using the brakes to achieve the desired climb rate. Don't attempt to climb at too steep an angle. Attempting to use too much brake to force a higher climb rate will only degrade the climb by creating extra drag and with the addition of lots of thrust could result in a stall or a spin.

Under power the Action GT behaves more like a powered fixed wing airplane than a paraglider, and it helps to think of it as such. Provided there are no obstacles in your path, it is often safer, and quite spectacular, to fly level with the ground after take-off gaining more speed before converting it into considerable height using the brakes and then easing off into the climb out.
The other reasons for not climbing out too steeply are the risks involved when having engine failure, i.e. a stall and diving recovery. Although the Action GT will not sit back behind you the way that some gliders may, a slow forward speed and high angle of attack is still likely to put you into a near stalled attitude if your power source suddenly goes on strike. In this situation you should always be able to set up a reasonable approach, so don't make things hard for yourself - fly with sufficient airspeed at all times, and keep your angle of attack under control a low altitudes.

Depending on the geometry of the set-up of your power unit, the propeller's torque effect may make itself felt as you leave the ground. Expect it to turn you and, if necessary, steer against it in order to maintain your direction. However, when countering the torque effect during a steep climb on slower trim settings under a lot of power, care must be taken to avoid the risk of stalling.

Because of the large vertical distance between the thrust line of the prop and the wing common to all paramotors, the extent of the power management required is critically dependent on your set up and flying ability.

Power induced Oscillations

Certain combinations of weight, power, and propeller size can cause oscillation where the torque and gyro effects lift the pilot to one side; you then drop back only to swing up again.
To counter this you can:-

Alter the throttle setting - and /or- Adjust the torque strap if fitted - and/or- Shift your weight in the harness.

Weight shift is the best counter. Oscillations usually occur on high power settings - more power and a larger propeller causes more effect.
It could be that your control inputs are amplifying the oscillation. In this case, throttling back a little and flying hands-off should take care of the problem.
It is quite common for less experienced pilots to be too busy on the controls, this is referred to as pilot induced oscillation, and the simple answer is stop moving your hands

3.2.d Level Flight

On reaching a safe height after take off, and if you wish to go cruising, turn on to your chosen heading, reach up and release the trimmers if on a slow setting and if you like let go of the brakes completely. If conditions are very rough you may wish to keep hold of them, however the Action GT is even more stable at higher speeds, so we suggest you let go and enjoy the flight.

Note –All paramotors should have adequate netting to prevent toggles entering propellers whilst in flight – check yours!

If you have one, keep an eye on your alti/vario. in level flight - it is easy to creep into a climb without noticing. Use the information from your instruments to optimize your forward speed and reduce drag and fuel consumption. This will all be specific to your own set up. With its hands-off flight capability, the Action GT is good at letting you do this.
With a sound understanding of the current wind conditions at different altitudes and intelligent use of any thermal activity, wave, convergence, ridge or frontal lift it is possible to conserve your fuel and greatly extend your operating range. The engine of course makes it easy to put you in the right place at the right time to exploit the conditions. Don't be afraid to throw the Action GT into a tight thermal to gain height and save fuel - you will find it is particularly good at coring thermals. Using slower trim settings will allow you to climb faster in thermals.

3.2.e Using the Trimmers and Speed Bar

The Action GT's reflex wing section is unique in this way, it basically has a huge range of trims and speed bar waiting for you to explore. We only ask that you explore the full flight envelop at a safe height and with adequate training and experience.

When the Action GT is tested under the AFNOR/CEN system, it was awarded a "performance" rating at the slower trim settings and a "performance" rating at the faster settings. Despite it having improved tuck resistance at the faster settings. The extra speed involved, means a higher energy recoveries.

The exact trim position where the Action GT, changes over its rating category is clearly outlined in the diagrams - See GTR 02 for details (It is the same for all current sizes).

Remarkably, the Action GT has a huge and relatively safe speed range, nearly 3.75 times greater than its stall speed compared with most air-craft that only have between 2-3 times.

With the trimmers fully off the wing's speed and stability increases and hence its ability to cut through turbulence and go places improves. On faster trim or speed bar settings, brake pressures generally increase and weight-shift or a wing tip stabiliser becomes more effective.

On the slower settings, sink rate improves and handling becomes lighter enabling you to make best use of thermal cores. Whilst giving you an improved climb rate and shorter slower take-offs and landings. See diagram RTR below describing differences in turning radii.

For correct usage, first study the GTR diagrams 1,2 & 3, showing trim and speed bar movement as well as speed bar hook-ups. The diagrams also show you the effect on the wing shape relative to the different settings, as well as the Center of Pressure changes (CP) showing differing levels of stability.

At all speed settings the differential application of both brakes while banking allows you to make very effective turns by increasing the lift to assist the turn when the lift axis is canted over in the bank. Likewise engine thrust and speed bar can be applied at certain times to increase turn rate etc. These techniques come with

3.2.e Using the Trimmers and Speed Bar (continued)

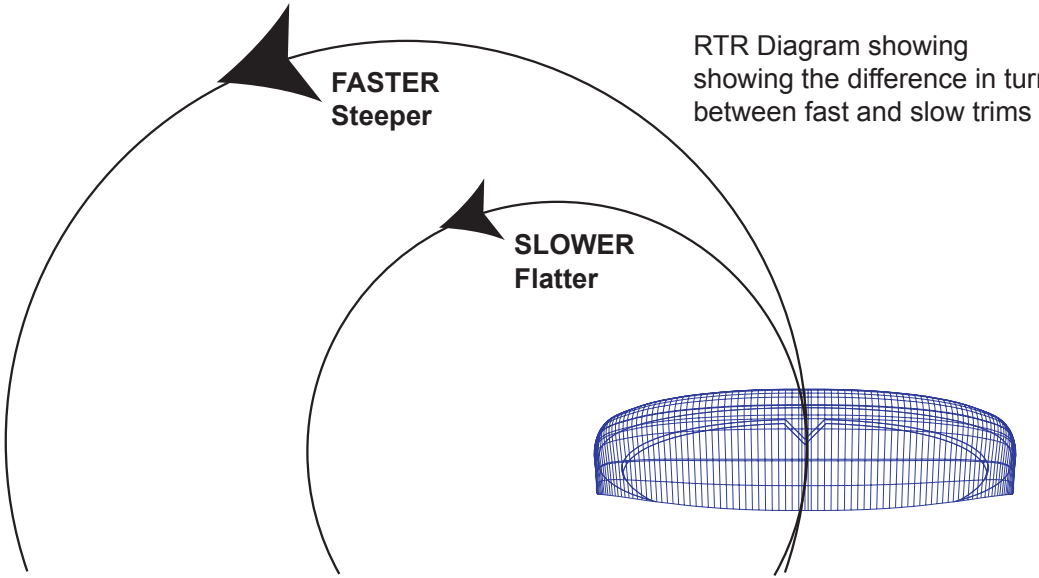
- more experience allowing you to get the most from your wing you to achieve fully coordinated, smooth turns, much like those possible on a three axis aircraft.

Points to Note:-

* Remember, trims and speed bar are controls are extra items for your pre-flight checks!

* If the trim settings inadvertently become asymmetric, the wing just crabs. Likewise, if lift is dumped, by releasing the trimmers accidentally, the Action GT's reflex wing section keeps the wing above your head and you just lose some height while accelerating.

* In general, when flown with the higher the hang point motor units, the wing will have more of a tendency to dive when entering turns and may also result in higher 'G' loadings, weight shift is also less effective. However often extra pendulum and lateral stability is gained.



RTR Diagram showing
showing the difference in turns
between fast and slow trims

3.3 Landing

There generally seems to be two philosophies about landing a paramotor - either with or without power.

3.3.a Power-off Landings

Cut all power at about 50m and glide in like a paraglider. This minimises the risk of propeller damage but you only get one go at it - you have to get it right!
With or without power the Action GT rides out turbulence much better on a fast trim setting, so if it is rough come in fast, allow yourself plenty of room (like a hang glider) and bleed off speed before you touch down. The Action GT stores energy well, so it may be necessary to round out and 'float' level with the ground, converting your excess speed into lift while you slow down, before flaring to touchdown.

Every pilot should practice landings without power, because one day your engine will fail and you will need this skill.
If you aim at a precision or tight landing, or in nil-wind conditions, it is advisable to use about half or even full trim (maximum lift configuration). This will hardly alter your glide angle but will decrease your sink rate; these decisions become more critical at higher wing loadings.

3.3.b Power-on Landings

At a steady tick over, lose height at a shallow angle, then as you near the ground level out and bleed off speed before flaring to touch down. Kill the motor as your feet touch the ground. The advantage of this method of course is that if you get it wrong you can power up and go round again at any time. The disadvantages are the increased risk of (expensive) prop damage if you stuff it up, the dangers involved in falling over with the engine running and getting your lines in the propeller if you forget to switch off before the wing deflates.

Points to note : -

* If possible, know all about your landing area before you take off.
* Check the wind direction before you set up your approach.
* Power-off landings probably need less space.
* If in doubt, practise your approach until you are sure you can land safely.

Advanced manoeuvres
The Action GT has achieved an AFNOR rating for the manoeuvres prescribed by the test authorities. However it is essential that pilots take proper training before attempting certain aerobatics.
We also suggest that you seek advice from instructors or experienced pilots before conducting ANY of these manoeuvres or go flying in extreme conditions, and that you carry a reserve parachute if this type of flying is for you.

Big ears.
This method is a good safe way of descending, However care should be taken when pulling down the outer A lines, not to pull them too far, the Action GT has a lot of load on the “A’s” especially on the faster trim settings. A spiral may be a more efficient way to get down. Note;- we do not recommend using big-ears with power, There is a risk of stable stall and it defeats the object.

B-Lining
The Action GT B-Lines well however we recommend that you undertake proper training as recovery characteristics change through out the trim range. A spiral is a much safer more efficient way to get down,

Adverse flight reactions

Cravats
Despite the intensive testing that has taken place. The Action GT is a modern wing, and in the name of performance it has an efficient line configuration. This means more gaps in between lines, so always a possibility of a cravat, this being when some of the canopy makes its way between lines after recovery from a deflation, either induced by the pilot or through severe turbulence. Normally pumping the brakes unravels the wing, if not then a sharp pull on the B's or D's usually does the job.

Stable stall
When any wing has many hours or has been over-loaded, one of the first signs of degradation is a tendency towards stable stalling. This may occur whilst exiting a high-energy or advanced manoeuvre.
When a power unit is added, it can even occur during a low airspeed take-off. Especially, when a powerful engine relative to the pilot weight and wing loading is used. It is also more likely on the slow speed trims.
Should you find yourself in this situation,
In flight
The quickest recovery is achieved by – coming off the power (if any) – give a short sharp pull on the brakes in unison, followed immediately by a firm but even pull on both A's at once.

During take-off
ALWAYS ensure that your wing is definitely flying with enough air speed, before opening the gas or pulling on any brakes during any launch. If it does happen that you have managed to leave the ground but are not fully flying, DO NOT add more power and more brakes but smoothly come off them, If the wing does not accelerate, just land. Re-assess the conditions as it may well be you are trying to climb out through a wind gradient.

Remember : - Stalling is common to all aircraft that take with insufficient air speed and then try to climb.
The trust line on a paramotor is well below the wing, so adding power adds to the problem.

All or the previously mentioned manoeuvres and recoveries from them, are taught on SIV courses.
Contact a local instructor or paragliding club for more Information about SIV.

3.4 GOLDEN RULES !!!

* Never place your engine downwind of your wing.
* Check, check and re-check the fuel system for leaks.
* Have you enough fuel to get you there? Better too much than too little!
* Check for any loose articles that could trail or fall into the propeller while flying and fasten them securely.
* If you spot a problem, no matter how small, deal with it NOW!
* Always put on and fasten your helmet before clipping in to the harness.
* Always carry out full pre-flight checks before launching.
* Try to control the glider on the ground facing forwards so as to keep the lines out of the prop. You should only turn to face the glider to avoid falling backwards onto the motor.
* Don't fly into danger - over water, trees, power lines etc. where an engine failure will leave you in trouble.
* Try not to fly into the turbulence of your own wake or that of others, especially at low altitude.
* It is unwise to fly hands-off below about 100m. AGL. as an engine failure below this height may require you to make immediate control inputs to set up a landing approach.
* Never rely on the engine: it may cut out at any moment. Always fly as if it will, so fly the wing – NOT the motor
* Except for collision avoidance, making a sharp turn against the torque effect during steep climbs can be dangerous: you may rapidly stall and enter a spin.
* Avoid downwind low flying: it drastically reduces your options!
* Be sensitive to mechanical problems early. A noticeable change in engine tone or a new vibration may spell trouble. Land and check it out.
* Make sure your navigation is up to the job.
* Remember, not everyone enjoys your engine noise. Care must be taken when flying near livestock.

4 Care and maintenance

The safety and life-span of any aircraft, however well designed, built and flown, depends in the end upon how well it is cared for. Confidence in your equipment and the quality of its maintenance is essential to good flying. Even a product as well engineered and carefully constructed as the Action GT can quickly deteriorate if neglected or abused. The better you look after your wing, the better it will look after you.

4.1 Basic Care

As with any paraglider, the basic rules for looking after your Paramania wing are :

* **Keep it Cool** : Prolonged exposure to excessive heat in places like the car, the loft or the airing cupboard as well as contact with hot engine parts can damage and significantly shorten the life of both cloth and lines.
* **Keep it Dry** : Packing or storing a wet wing may make it mouldy, damage the coating of the fabric, corrode the metal fittings and in extreme cases rot both the cloth and the lines.
Salt water is particularly harmful (as salt crystals form an abrasive coating).
You should avoid immersing your wing if at all possible. If it does happen, rinse it thoroughly in fresh water and dry it out completely, preferably in the shade, before packing it away.
* **Keep it dark** : U V light degrades coatings and drastically weakens fabrics.
Never leave your wing laid out for long periods beneath holes in the ozone layer. Fold or pack it away when it's not in the air.
* **Keep it clean** : Some dirt can be highly corrosive. Clean off any such contamination as soon as possible using clean, fresh water. Don't use detergents: they can cause as much damage as the stains, if not more. In particular, store and transport your wing away from the motor (never in the same bag) to avoid any contact with oil or petrol.
* **Keep it Clear** : Sharp, hard or abrasive items such as helmets, flight instruments, harness buckles and the like can accelerate fabric wear and even hole the wing. The drawstring stuff-bag provided with your canopy affords a measure of protection but you should still try to ensure that you store and transport it clear of contact with anything likely to damage it.
* **Keep it Lonely** : Insects, such as grass-hoppers and ants will simply eat their way out if rolled up with the wing. Grazing cattle can literally lick the coatings off the fabric and mice love to make homes in canopies! (We suggest hanging up your wing in its bag during long term storage)

Above all, remember that for all its portability, your paraglider is an aeroplane and deserves to be treated as such!

4.2 Periodic Maintenance

Although your Action GT powerglider, is designed and engineered to give you at least 400 hrs of air time, regular maintenance is essential to pinpoint any problems that may arise as a result of routine wear and tear and is especially important after any incident which may have resulted in fabric or line damage that may not show up in the course of pre-flight checks. Paramania or its accredited agents will, for a small charge, carry out a specified programme of maintenance checks designed to keep your wing in tip-top shape and certify its condition in a written report that will become a valuable part of its service history.
Paramania takes great pride in the quality of both its product and the service that supports it. Feedback from periodic maintenance checks performs a vital role in its quality assurance procedures. They are therefore just as important to us as they are to you and you can be confident that all such checks carried out by the manufacturer are comprehensive and thorough.

We recommend that these inspections are carried out annually or after every 100 flying hours, whichever is the sooner. They are, of course, an essential addition to rather than a substitute for the canopy and line inspections that form part of your own pre-flight checks.

4.3 Repairs

A repair kit is provided with your Action GT powerglider that allows you to carry out small-scale emergency repairs. It consists of about 1 metre of each nylon fabric used in its construction, in self adhesive rip-stop tape and two spare suspension lines, looped at both ends and of the same length and thickness as your longest primary.

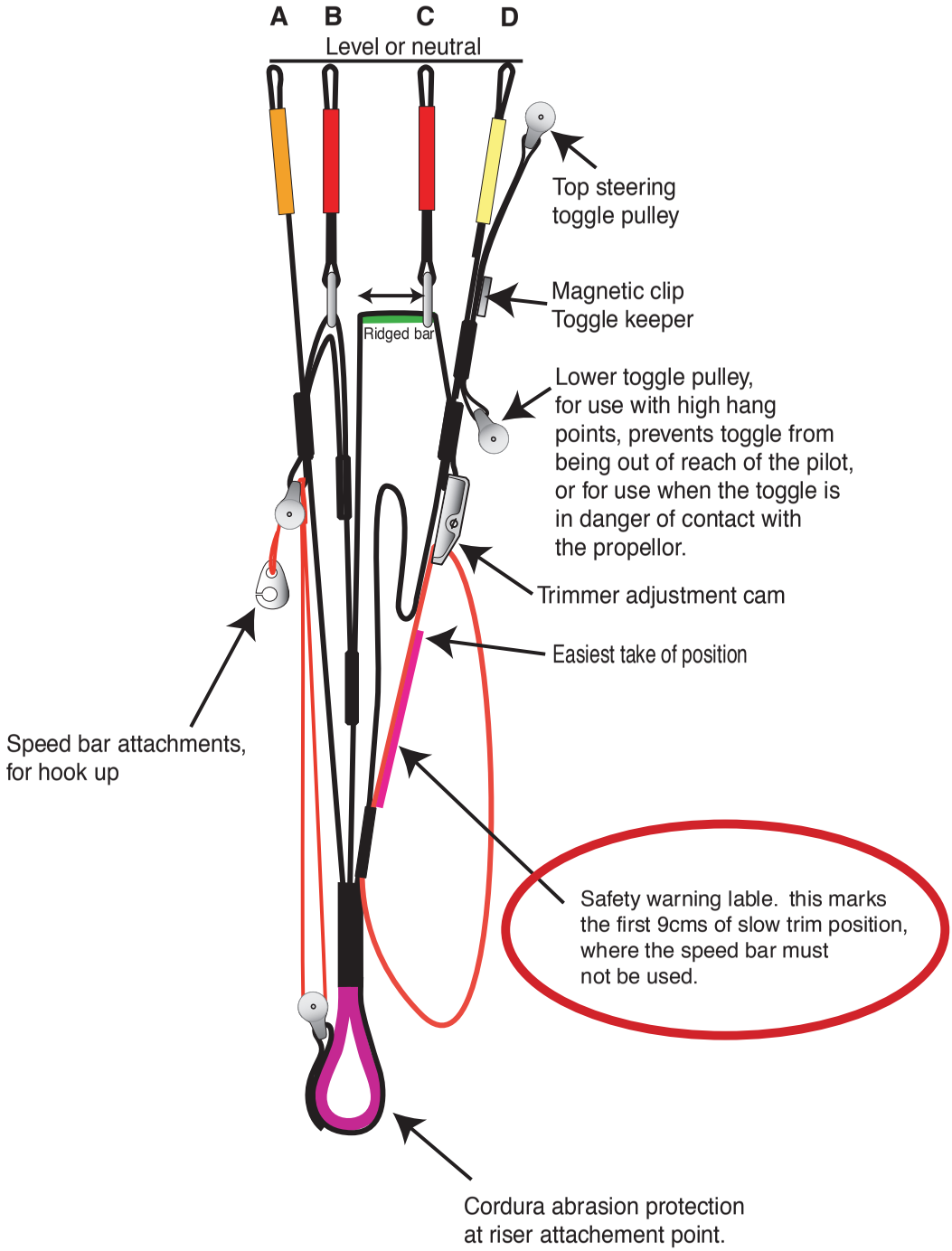
Damage beyond the scope of this kit to deal with and more major repairs that may be necessary to loaded parts of the wing's structure, such as seams, line attachments, ribs, risers, leading and trailing edges etc. should on no account be carried out by anyone other than a Paramania accredited agent or at the very least a qualified parachute rigger.
The manufacturers can accept no responsibility for repairs, however minor, carried out by anyone other than themselves nor for any damage to the wing resulting from accident, neglect, negligence or abuse. In all such cases any statutory rights and obligations of guarantee are automatically cancelled.

4.4 Care and Maintenance of your Power Unit

This manual refers only to your Action GT powerglider and any issues to do with the Power Pack you are using is beyond its remit. Refer to the relevant literature for details of care, maintenance, servicing and repair concerning your motor and harness. However we can offer advice if requested.

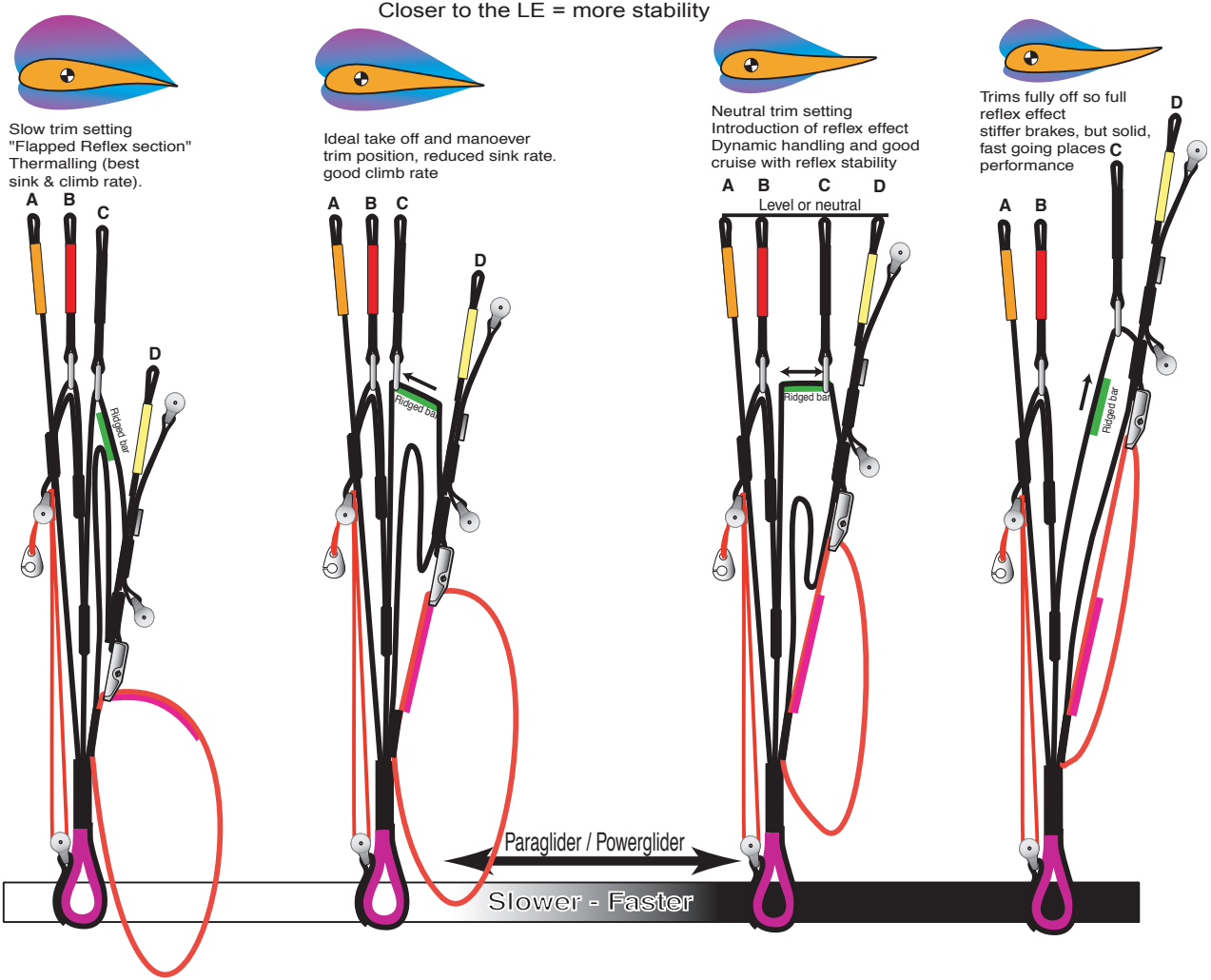
5 Technical diagrams

Diagram GTR01 showing Action GT risers with the semi-ridged trim in position @ neutral


A
B
C
D
Level or neutral
Top steering toggle pulley
Magnetic clip Toggle keeper
Ridged bar
Lower toggle pulley, for use with high hang points, prevents toggle from being out of reach of the pilot, or for use when the toggle is in danger of contact with the propellor.
Trimmer adjustment cam
Easiest take of position
Speed bar attachments, for hook up
Safety warning lable. this marks the first 9cms of slow trim position, where the speed bar must not be used.
Cordura abrasion protection at riser attachement point.

GTR2 Diagram - showing different trim positions and their effect on the wing section

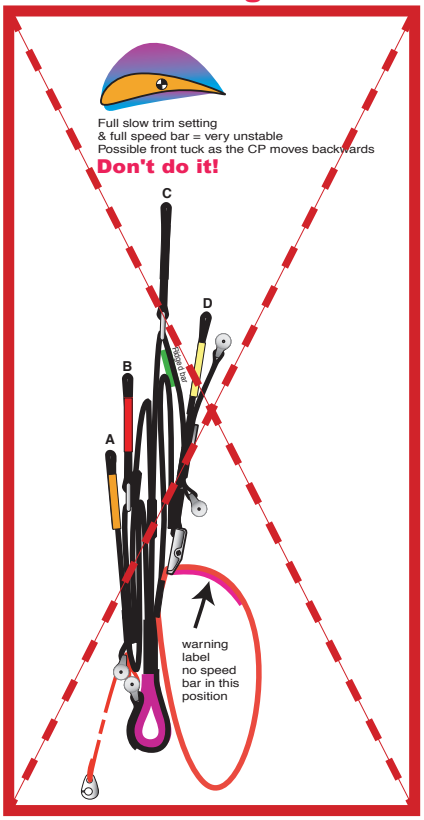
Note ⊕ = Center of pressure movement
Closer to the LE = more stability



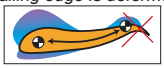
GTR03 Diagram showing trim positions with speed bar

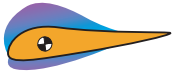
Note ⊕ = Center of pressure movement
Closer to the LE = more stability

Warning do not fly with this configuration

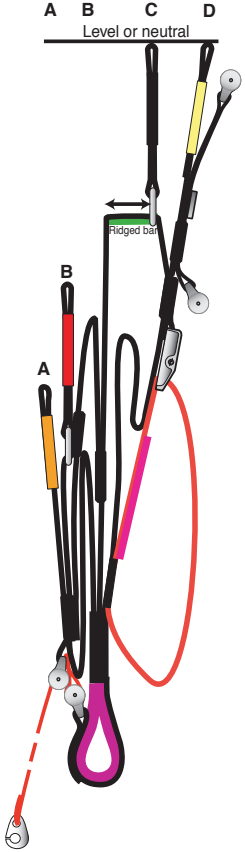


At these faster settings application of brake removes the Reflex stability, as the trailing edge is deformed.
I.e Fly with less brake, Try to use wing tip steering and/or weight shift instead.



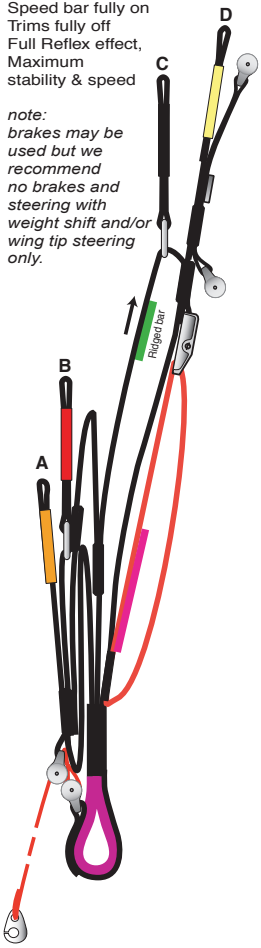


Neutral trim setting
with speed bar
speed bar may be used above
this trim position (faster settings)



Speed bar fully on
Trims fully off
Full Reflex effect,
Maximum
stability & speed

note:
brakes may be used but we recommend no brakes and steering with weight shift and/or wing tip steering only.



About the warnings in diagram GTD 3

The Action GT It is able to offer a much wider performance range, precisely because it can safely change its shape. It is the reason why standard paragliders have much less than the 22cms of trimmer and speed bar movement available on the GT.

On almost all air-craft, there is a speed restriction on when you can “safely” apply “Flaps” the reason is that if you use them whilst flying too fast or increase speed too much with them on – you can physically tear the wings off. Luckily in our case the aircraft/ paraglider rebuilds its self with its ram air system.

The same effect is present with any top performing paraglider when brakes are applied with full speed bar. Generally it is easier to induce a frontal collapse, especially in turbulence

Fortunately the combination of speed with flaps, serves no purpose as it is like driving a sports car with the handbrake on.

The paramania team have explored the GT’s stability at all the trim settings and have found this one area to be avoided.
For this reason is clearly marked on the glider and in this manual information.

Action GT 23.5m lines V10 - M.C-J 17-2-06

VER : REV8
PDATED ########

A - lines

primary 23.5m		secondary 23.5m		Third 23.5m	
		AS-0	1590	AT-0	460
				AT-1	596
		AS-1	1340	AT-2	570
AP-1	5225				
		AS-2	1340	AT-3	561
				AT-4	580
				AT-5	656
		AS-3	1862	AT-6	618
				AT-7	565
AP-2	4655	AS-4	1862		
				AT-8	565
		AS-5	1862	AT-9	603
				AT-1(	625
				AT-1	565
		AS-6	1862	AT-1;	509
				AT-1:	627
AP-3	4655	AS-7	1615		
				AT-1<	592
		AS-8	1425	AT-1!	755
				AT-1(	703
				AT-1'	675

B - lines

primary 23.5m		secondary 23.5m		Third 23.5m	
		BS-0	1556	BT-0	402
				BT-1	512
		BS-1	1340	BT-2	485
BP-1	5225				
		BS-2	1340	BT-3	479
				BT-4	499
				BT-5	579
		BS-3	1862	BT-6	542
				BT-7	491
BP-2	4655	BS-4	1862		
				BT-8	493
		BS-5	1862	BT-9	538
				BT-1(	561
				BT-1	508
		BS-6	1862	BT-1;	456
				BT-1:	588
BP-3	4655	BS-7	1615		
				BT-1<	557
		BS-8	1425	BT-1!	724
				BT-1(	676
				BT-1'	649

C - lines

primary 23.5m		secondary 23.5m		Third 23.5m	
		CS-0	1572	CT-0	505
				CT-1	621
		CS-1	1340	CT-2	597
CP-1	5225				
		CS-2	1340	CT-3	588
				CT-4	607
				CT-5	683
		CS-3	1862	CT-6	648
				CT-7	596
CP-2	4655	CS-4	1862		
				CT-8	597
		CS-5	1862	CT-9	637
				CT-1(	659
				CT-1	599
		CS-6	1862	CT-1;	544
				CT-1:	668
CP-3	4655	CS-7	1615		
				CT-1<	633
		CS-8	1425	CT-1	792
				CT-1(	739
				CT-1	701

D - lines -

primary 23.5m		secondary 23.5m		Third 23.5m		23.5m	
		DS-0	1611	DT-0	616		
		DS-1	1951	DT-1	199		
				DT-2	167		
DP-1	5225	DS-2	1902	DT-3	191		
				DT-4	179		
		DS-3	1894	DT-5	182		
				DT-6	188		
		DS-4	1929	DT-7	173		
				DT-8	196		
						DQ-1	208
				DT-5	925	DQ-2	156
						DQ-3	187
		DS-5	1615	DT-6	857	DQ-4	180
						DQ-5	196
				DT-7	822	DQ-6	171
DP-2	4655	DS-6	1615				
				DT-8	818	DQ-7	173
						DQ-8	196
		DS-7	1615	DT-9	839	DQ-9	187
						DQ-10	183
				DT-1(	875	DQ-11	168
						DQ-12	202
						DQ-13	218
				DT-1	826	DQ-14	145
						DQ-15	191
		DS-8	1615	DT-1;	718	DQ-16	166
						DQ-17	203
				DT-1	632	DQ-18	144
DP-2	4655	DS-9	1615				
				DT-1(	546	DQ-19	185
						DQ-20	172
		DS-1	1615	DT-1	450	DQ-21	207
						DQ-22	131
				DT-1(	319	DQ-23	187
						DQ-24	146

Action GT 23.5m lines V10 - M.C-J 17-2-06

VER : REV8
PDATED ########

Brake - lines (E)'s

correction 26-4-06

primary 23.5m		secondary 23.5m		third 23.5m		23.5m		Mid cell number			
						EQ-1	827	1			
				ET-1	1701	EQ-2	708	3			
		ES-1	2926								
				ET-2	1608	EQ-3	665	5			
						EQ-4	620	7			
						EQ-5	884	9			
				ET-3	1666	EQ-6	751	11			
						EQ-7	789	13			
EP-1	2926	ES-2	2484	ET-4	1528						
Add (	250					EQ-8	713	15			
				ET-5	1528	EQ-9	689	17	TE RING	198	60	10
						EQ-1	637	19	TE RING	198	60	10
						EQ-1	988	21				
				ET-6	1362	EQ-1	789	23	TE RING	185	60	10
						EQ-1	637	25	TE RING	189	60	10
		ES-3	2237	ET-7	1415				stitch excess loop			
						EQ-1	532	27	TE RING	195	60	10
				ET-8	1319	EQ-1	532	29	TE RING	187	60	10
						EQ-1	523	30				
						EQ-1	437	31				
						EQ-1	437	32				

Stablizer lines			
Primary	23.5r	secon	23.5m
		SS-A	1083
SP-1	5368	SS-B	1072
		SS-B	1074
		SS-C	1087
		SS-D	1115

Colour code - materials	TOTALs	lengths	% se	number of lines
GIN Kevlar 2.3mm 360 KG (181kg after		0	0	4
GIN Kevlar 1.6mm 208 KG (112kg after		0	0	13
GIN Kevlar 1.3mm 114 KG (60kg after c		0	0	51
GIN Kevlar 1.1mm 90 KG (47kg after dr		0	0	99

total line on the wing (complete wing) 0 mm 0 Lines

Notes TE-RINGS mounted at centre of tailing edge panels (see 3d drawing)
Brake line tabs mounted to the middle of each odd numbered panel

Action GT 26m lines V10 - M.C-J 17-2-06

VER : REV8
UPDATED : 09-May-06

A - lines

primary		secondary		Thirtery	
				26m GT	
		AS-0	1674	AT-0	484
				AT-1	627
		AS-1	1410	AT-2	600
AP-1	5500				
		AS-2	1410	AT-3	591
				AT-4	610
				AT-5	690
		AS-3	1960	AT-6	651
				AT-7	595
AP-2	4900	AS-4	1960		
				AT-8	595
		AS-5	1960	AT-9	635
				AT-1(	658
				AT-11	595
		AS-6	1960	AT-1(	536
				AT-1:	660
AP-3	4900	AS-7	1700		
				AT-1(	623
		AS-8	1500	AT-1!	795
				AT-1(	740
				AT-17	711

B - lines

primary		secondary		Thirtery	
				26m GT	
		BS-0	1638	BT-0	423
				BT-1	539
		BS-1	1410	BT-2	511
BP-1	5500				
		BS-2	1410	BT-3	504
				BT-4	525
				BT-5	609
		BS-3	1960	BT-6	570
				BT-7	517
BP-2	4900	BS-4	1960		
				BT-8	519
		BS-5	1960	BT-9	566
				BT-1(	591
				BT-11	535
		BS-6	1960	BT-1:	480
				BT-1:	619
BP-3	4900	BS-7	1700		
				BT-1(	586
		BS-8	1500	BT-1!	762
				BT-1(	712
				BT-17	683

C - lines

primary		secondary		Thirtery	
				26m GT	
		CS-0	1655	CT-0	532
				CT-1	654
		CS-1	1410	CT-2	628
CP-1	5500				
		CS-2	1410	CT-3	619
				CT-4	639
				CT-5	719
		CS-3	1960	CT-6	682
				CT-7	627
CP-2	4900	CS-4	1960		
				CT-8	628
		CS-5	1960	CT-9	671
				CT-1(	694
				CT-1:	630
		CS-6	1960	CT-1:	573
				CT-1:	703
CP-3	4900	CS-7	1700		
				CT-1(	666
		CS-8	1500	CT-1!	834
				CT-1(	778
				CT-17	738

D - lines -

primary		secondary		Thirtery		
				26m GT		26m G
		DS-0	1696	DT-0	648	
		DS-1	2054	DT-1	209	
				DT-2	176	
DP-1	5500	DS-2	2002	DT-3	201	
				DT-4	188	
		DS-3	1994	DT-5	192	
				DT-6	198	
		DS-4	2030	DT-7	182	
				DT-8	206	
						DQ-1 219
				DT-5	974	DQ-2 164
						DQ-3 197
		DS-5	1700	DT-6	902	DQ-4 189
						DQ-5 206
				DT-7	865	DQ-6 180
DP-2	4900	DS-6	1700			
				DT-8	861	DQ-7 182
						DQ-8 206
		DS-7	1700	DT-9	883	DQ-9 197
						DQ-10 193
				DT-1(	921	DQ-11 177
						DQ-12 213
						DQ-13 229
				DT-1'	869	DQ-14 153
						DQ-15 201
		DS-8	1700	DT-1:	756	DQ-16 175
						DQ-17 214
				DT-1:	665	DQ-18 152
DP-2	4900	DS-9	1700			
				DT-1(	575	DQ-19 195
						DQ-20 181
		DS-1(	1700	DT-1!	474	DQ-21 218
						DQ-22 138
				DT-1(	336	DQ-23 197
						DQ-24 154

Action GT 26m lines V10 - M.C-J 17-2-06

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Brake - lines (E)'s

prim	26m (	secc	26m G	thirta	26m GT		26m	Mid cell n	26m GT		
					EQ-1	951	1				
				ET-1	1791	EQ-2	804	3			
		ES-1	3080								
				ET-2	1693	EQ-3	784	5			
						EQ-4	715	7			
						EQ-5	941	9			
				ET-3	1754	EQ-6	804	11			
						EQ-7	843	13			
EP-1	3080	ES-2	2615	ET-4	1608						
Add	250					EQ-8	764	15			
				ET-5	1608	EQ-9	735	17	TE R	198	60 10
						EQ-1	725	19	TE R	198	60 10
						EQ-1	970	21			
				ET-6	1434	EQ-1	833	23	TE R	185	60 10
						EQ-1	715	25	TE R	189	60 10
		ES-3	2355	ET-7	1489						
						EQ-1	568	27	TE R	195	60 10
				ET-8	1388	EQ-1	580	29	TE R	187	60 10
						EQ-1	510	30			
						EQ-1	464	31			
						EQ-1	464	32			

Stablizer lines

Prim	26m (	secc	26m GT
		SS-/	1140
SP-1	5650	SS-E	1128
		SS-E	1131
		SS-(	1144
		SS-E	1174

Colour code - mat(	TO	lengths	% s	number of lines
GIN Kevlar 2.3mm 360 KG	0	0		4
GIN Kevlar 1.6mm 208 KG	0	0		13
GIN Kevlar 1.3mm 114 KG	0	0		51
GIN Kevlar 1.1mm 90 KG (	0	0		99

stitcl excess lo total line on the win 0 mm 0 Lines

Notes TE-RINGS mounted at centre of tailing edge panels (see 3d drawi
Brake line tabs mounted to the middle of each odd numbered panel

Action GT 28m lines V10 - M.C-J 26-4-06

VER : REV8
UPDATED : 09-May-06

A - lines				B - lines				C - lines				D - lines -					
prima	28m	secor	28m	Thirte	28m	prima	28m	secor	28m	Thirte	28m	primary		secor	28m	Thirtery	
		AS-0	1749	AT-0	506			BS-0	1712	BT-0	442			CS-0	1729	CT-0	556
				AT-1	655					BT-1	563					CT-1	683
		AS-1	1473	AT-2	627			BS-1	1473	BT-2	534			CS-1	1473	CT-2	656
AP-1	5748					BP-1	5748					CP-1	5748				
		AS-2	1473	AT-3	618			BS-2	1473	BT-3	527			CS-2	1473	CT-3	647
				AT-4	637					BT-4	549					CT-4	668
				AT-5	721					BT-5	636					CT-5	751
		AS-3	2048	AT-6	680			BS-3	2048	BT-6	596			CS-3	2048	CT-6	713
				AT-7	622					BT-7	540					CT-7	655
AP-2	5121	AS-4	2048			BP-2	5121	BS-4	2048			CP-2	5121	CS-4	2048		
				AT-8	622					BT-8	542					CT-8	656
		AS-5	2048	AT-9	664			BS-5	2048	BT-9	591			CS-5	2048	CT-9	701
				AT-1(	688					BT-1(	618					CT-1	725
				AT-1	622					BT-1	559					CT-1	658
		AS-6	2048	AT-1;	560			BS-6	2048	BT-1;	502			CS-6	2048	CT-1	599
				AT-1:	690					BT-1:	647					CT-1	735
AP-3	5121	AS-7	1777			BP-3	5121	BS-7	1777			CP-3	5121	CS-7	1777		
				AT-1;	651					BT-1;	612					CT-1;	696
		AS-8	1568	AT-1!	831			BS-8	1568	BT-1!	796			CS-8	1568	CT-1	872
				AT-1(	773					BT-1(	744					CT-1	813
				AT-1'	743					BT-1'	714					CT-1	771

D - lines -							
prima	28m	secor	28m	Thirte	28m GT		28m GT
		DS-0	1772	DT-0	677		
		DS-1	2146	DT-1	218		
				DT-2	184		
DP-1	5748	DS-2	2092	DT-3	210		
				DT-4	196		
		DS-3	2084	DT-5	201		
				DT-6	207		
		DS-4	2121	DT-7	190		
				DT-8	215		
						DQ-1	229
				DT-5	1018	DQ-2	171
						DQ-3	206
		DS-5	1777	DT-6	943	DQ-4	198
						DQ-5	215
				DT-7	904	DQ-6	188
DP-2	5121	DS-6	1777				
				DT-8	900	DQ-7	190
						DQ-8	215
		DS-7	1777	DT-9	923	DQ-9	206
						DQ-10	202
				DT-1(	962	DQ-11	185
						DQ-12	223
						DQ-13	239
				DT-1	908	DQ-14	160
						DQ-15	210
		DS-8	1777	DT-1;	790	DQ-16	183
						DQ-17	224
				DT-1:	695	DQ-18	159
DP-2	5121	DS-9	1777				
				DT-1(	601	DQ-19	204
						DQ-20	189
		DS-1	1777	DT-1!	496	DQ-21	228
						DQ-22	144
				DT-1(	351	DQ-23	206
						DQ-24	161

Action GT 28m lines V10 - M.C-J 26-4-06

VER : REV8
UPDATED : 09-May-06

Brake - lines (E)'s

prima	28m	secor	28m	thirta	28m GT		28m	Mid cell nu	28m GT	
						EQ-1	909	1		
				ET-1	1872	EQ-2	779	3		
		ES-1	3219							
				ET-2	1769	EQ-3	732	5		
						EQ-4	682	7		
						EQ-5	972	9		
				ET-3	1833	EQ-6	826	11		
						EQ-7	867	13		
EP-1	3219	ES-2	2733	ET-4	1680					
Add (	250					EQ-8	784	15		
				ET-5	1680	EQ-9	758	17 TE R	207	60
						EQ-1	700	19 TE R	207	60
						EQ-1	1087	21		
				ET-6	1499	EQ-1	867	23 TE R	193	60
						EQ-1	700	25 TE R	198	60
		ES-3	2461	ET-7	1556					stitching
						EQ-1	585	27 TE R	204	60
				ET-8	1450	EQ-1	585	29 TE R	195	60
						EQ-1	575	30		
						EQ-1	481	31		
						EQ-1	481	32		

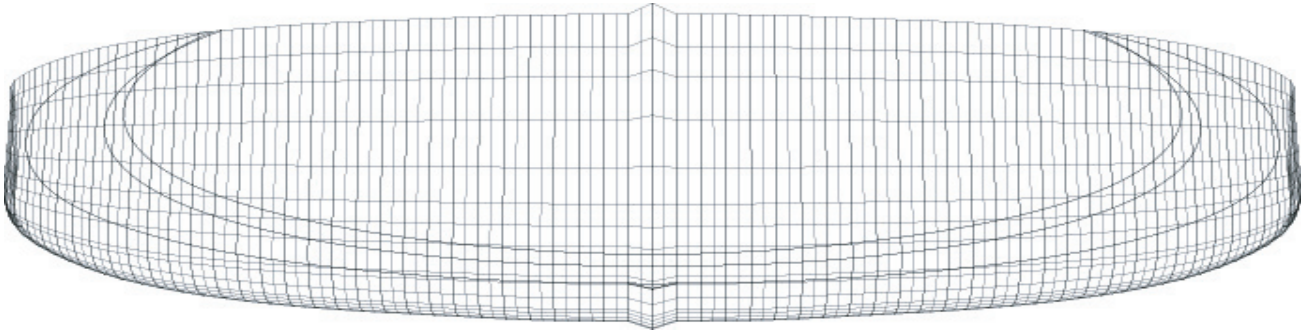
Stabliz	28m GT		28m GT
Primary		secondary	
		SS-A	1191
SP-1	5904	SS-B	1179
		SS-B+	1182
		SS-C	1195
		SS-D	1227

Colour code - materials	TOTALs	lengths	% sewin	number of lines
GIN Kevlar 2.3mm 360 KG (181kg after dhv c		0	0	4
GIN Kevlar 1.6mm 208 KG (112kg after dhv c		0	0	13
GIN Kevlar 1.3mm 114 KG (60kg after dhv cy		0	0	51
GIN Kevlar 1.1mm 90 KG (47kg after dhv cyc		0	0	99
				167
total line on the wing (complete wing)		0 mm		0

Notes TE-RINGS mounted at centre of tailing edge panels (see 3d drawing)
Brake line tabs mounted to the middle of each odd numbered panel

Technical Data for Paramania Action GT

Technical aspects		Action gt 23.5m	Action gt 26m	Action gt 28m
Number of cells		66 cells	66 cells	66 cells
Area flat		23.5 Sq metres	26.04 Sq metres	28.04 Sq metres
Max cord		2625 mm	2763 mm	2973 mm
Min cord		541 mm	569 mm	600 mm
mean cord		1983 mm	2070 mm	2163 mm
span		11680 mm	12186 mm	12733 mm
aspect ratio		5.89	5.89	5.89
Span projected		9425 mm	9825 mm	10364 mm
aspect ratio projected		4.75	4.75	4.75
Area projected		22.01 Sq metres	24 Sq metres	25.80 Sq metres
Pilot distance from wing		7429 mm	7820 mm	8172 mm
risers		470 mm	470 mm	470 mm
width of hang points		420 mm	420 mm	420 mm



rec weight ranges	PPG	65 - 135 Kg	75 - 155 Kg	85-170 Kg
	PG	55 - 80 Kg	65 - 100 Kg	75 - 125 Kg
Glide weight		7.2 Kg	8 Kg	8.4 Kg
Trimmer Travel		19 cms	19 cms	19 cms
Speed bar travel		19 cms	19 cms	19 cms
Performances in mid ranges (Approx as there are too many variables, Drag - motor/pilot, total weight - fuel/clothing - speed bar/trimmers etc.)				
Glide angle		9+	9+	9+
Min sink	PPG	1.6 M/sec	1.6 M/sec	1.6 M/sec
Min sink no motor unit	PG	1.1 M/sec	1.1 M/sec	1.1 M/sec
Speeds				
Min speed	PPG	18	18	18
min trim cruise	PPG	24	24	24
neutral trim cruise	PPG	32	32	32
Max trim speed	PPG	48	48	48
max speed	PPG	65	65	65

5.4 CEN Data Label copy

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6 SUMMARY

We would like to stress again the points made in Section 1 of this Manual.
The Action GT Powerglider Manual is subject to continuous updating.
To assist us in our quest for perfection, we would appreciate any input that you the customer may contribute towards future versions.

Please don’t hesitate to contact us to let us know your views.

From the Paramania Team

Wishing you many hours of flying fun on your Action GT Powerglider.

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